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A paper was read, entitled, "Experiments made on a piece of Peña silver, saved from the Lady Charlotte, wrecked on the coast of Ireland in December 1838, as to its capability of holding water." By W. D. Haggard, Esq. Communicated by Sir Henry Ellis, K.H., F.R.S.

Plata Peña, so called, is silver collected by quicksilver after the ore is pounded; it is then placed in a mould, and by great force the quicksilver is squeezed out, when it forms a mass, resembling dry mortar, of great porosity.

| | Troy Weight. lbs. oz. dwts. | Decrease in weight. lbs. oz. dwts. |
|--|--------------------------------|--|
| Original weight when taken from the box } | 38 10 0 | |
| One day placed before the fire | 37 0 15 | 1 9 5 |
| Third day | 35 5 0 | 1 7 0 |
| Fifth day | 34 5 5 | 0 11 15 |
| Eighth day | 34 0 2 | 0 5 3 |
| Weight of water | | 4 9 3 |
| Weight of the piece supposed to be quite dry } | 34 0 2 | Increase in weight. lbs. oz. dwts. |
| First day from the fire | 34 0 3 | 0 0 1 |
| Third day | 34 2 5 | 0 2 2 |
| Fifth day | 34 4 2 | 0 1 17 |
| Eighth day | 34 4 9 | 0 0 7 |
| Gained in water from the air | | 0 4 7 |
| Weight after water had been forced into it } | 39 1 19 | 4 9 10 |
| Total weight of water contained in the piece | | 5 1 17 |

A paper was also read, entitled, "On the Application of the Conversion of Chlorates and Nitrates into Chlorides, and of Chlorides into Nitrates, to the determination of several equivalent numbers." By Frederick Penny, Esq. Communicated by H. Hennell, Esq. F.R.S.

The researches which form the subject of this paper were suggested by an inquiry into the most effectual method of ascertaining the quantity of nitrate of potassa existing in crude saltpetre. The author found that by the action of hydrochloric acid the nitrate of potassa was converted into the chloride of potassium; and conversely, that the chloride of potassium might, by the proper regulation of the temperature, be reconverted into the nitrate of potassa by the action of nitric acid. These mutual conversions afforded excellent means of determining, with great exactness, the relative equivalent numbers, in the theory of definite proportions, belonging to these salts, and to their respective constituent elements. The author, accordingly, pursued the investigation of these numbers by several successive steps, of which the details occupy the greater part of the present paper. He first determines the equivalent of chloride of potassium by decomposing chlorate of potassa into oxygen and chlo-

ride of potassium; the proportion between which gives the ratio which the respective equivalent numbers of each bear to one another, and also to that of chlorate of potassa. The equivalent of nitrate of potassa is next obtained by converting the chlorate and the chloride of potassium into that salt; and from these data the equivalents of chlorine and of nitrogen are deduced. A similar train of inquiry is next instituted with the corresponding salts having sodium for their base: chlorate of soda being decomposed into the chloride, and into the nitrate; nitrate of soda into chloride; and chloride of sodium into nitrate of soda. The results of these different series of experiments coincide so closely with one another as mutually to confirm their general accuracy in the most satisfactory manner. For the purpose of determining the equivalent numbers of the elementary bodies themselves, (namely, chlorine, nitrogen, potassium, and sodium,) the author employed the intermedium of silver, the several saline combinations of which with chlorine and with nitric acid were found to afford peculiar advantages for the accurate determination of the relative weights of the constituents of these salts, when subjected to various combinations and decompositions. The conclusions to which the author arrives with regard to the equivalent numbers for the six elementary bodies in question, tend to corroborate the views of the late Dr. Turner, and to overturn the favourite hypothesis that all equivalent numbers are simple multiples of that for hydrogen. He finds these numbers to be as follow:

| | |
|---------------------|--------|
| Oxygen | 8 |
| Chlorine | 35.45 |
| Nitrogen | 14.02 |
| Potassium | 39.08 |
| Sodium | 23.05 |
| Silver | 107.97 |

The author intends to pursue these inquiries, by applying similar methods to the investigation of other classes of salts.

January 31, 1839.

JOHN W. LUBBOCK, Esq., Vice-President and Treas.,
in the Chair.

John Wesley Williams, and James Yates, Esqrs., were severally elected Fellows of the Society.

A paper was read, entitled, "Some account of the Art of Photogenic Drawing, or the Process by which Natural Objects may be made to delineate themselves without the aid of the Artist's Pencil." By H. F. Talbot, Esq., F.R.S.

In this communication the author states, that during the last four or five years he has invented and brought to a considerable degree